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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,799	10/03/2003	Tobias Gerlach	KOA 0242 PUS (R 1415)	3893
22045	7590	07/30/2004	EXAMINER	
BROOKS KUSHMAN P.C. 1000 TOWN CENTER TWENTY-SECOND FLOOR SOUTHFIELD, MI 48075			WEST, JEFFREY R	
			ART UNIT	PAPER NUMBER
			2857	

DATE MAILED: 07/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/678,799	Applicant(s) GERLACH, TOBIAS <i>et al</i>	
	Examiner Jeffrey R. West	Art Unit 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 July 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 and 9-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. In view of the After Final Response filed on July 12, 2004, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 6, 11-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,977,732 to Matsumoto in view of U.S. Patent No. 4,924,166 to Roussel and further in view of U.S. Patent No. 4,583,190 to Salb.

Matsumoto discloses a method for determining the frequency of current ripples contained in the analog armature current signal of a commutated direct current motor (column 6, lines 31-32 and 60) comprising determining an armature current signal (column 6, lines 34-37 and column 7, lines 20-21), determining an electric operating parameter of the motor (column 6, lines 34-37 and column 7, lines 18-19), determining a result of the current ripples contained in the armature current signal based on the armature current signal and the motor electric operating parameter and determining current ripple frequency from the current ripples contained in the

armature current signal, without filtering (column 7, lines 18-21), during a start-up phase of the motor (column 6, lines 37-50 and column 11, lines 11-17).

Matsumoto discloses that the motor electric operating parameter is an armature voltage signal (column 6, lines 34-37 and column 7, lines 18-19).

Matsumoto discloses determining the rotational speed of a drive shaft of the motor based on the current ripple frequency (column 7, lines 25-28).

Matsumoto discloses monitoring the current ripple frequency for changes during the operation of the motor (column 12, lines 13-27 and 52-60) by counting the current ripples contained in the armature current signal and modifying the number of counted ripples as a function of a changes in the current ripple frequency (column 7, lines 33-38).

As noted above, the invention of Matsumoto teaches many of the features of the claimed invention and while the invention of Matsumoto explicitly states that the ripple detector determines a current ripple frequency based on both an armature current signal and an armature voltage signal, Matsumoto does not explicitly state that the ripple detector determines the current ripple frequency based on differences between the current and voltage signals.

Roussel discloses a method for determining the frequency of current ripples contained in the armature current signal of a commutated direct current motor (column 1, lines 9-13) comprising determining an armature current signal, determining an electric operating parameter of the motor (i.e. signal taken across the terminals of a shunt), subtracting the armature current signal and the motor electric

operating parameter from one another to determine the current ripples contained in the armature current signal (column 5, lines 28-33), and determining a current ripple frequency from the current ripples contained in the armature current signal (column 2, lines 43-50). Roussel also discloses that the motor electric operating parameter is an armature voltage signal (column 4, lines 48-53) and the current ripple frequency is determined during a start-up phase of the motor (column 1, lines 42-45).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsumoto to explicitly state that the ripple detector determines the current ripple frequency based on differences between the current and voltage signals, as taught by Roussel, because Matsumoto does disclose determining a current ripple frequency based on both an armature current signal and an armature voltage signal, but does not give a corresponding relationship and Roussel suggests such a relationship for determining the current ripple frequency.

As noted above, the invention of Matsumoto and Roussel teaches many of the features of the claimed invention including determining both armature current and voltage signals to determine the frequency of current ripples in the armature current signal. The combination does not, however, specifically determine a frequency spectral result of these current and voltage signals through digitization and a Fast Fourier transform.

Salb teaches a microcomputer-based system for performing Fast Fourier Transforms wherein the analog signals being analyzed are first digitized at each

point in time and then analyzed using a fast Fourier transform to obtain an unfiltered frequency spectral result (column 7, lines 46-48).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsumoto and Roussel to include determining a frequency spectral result of these current and voltage signals through digitization and a fast Fourier transform, as taught by Salb, because this method for frequency analysis is well-known in the art to provide the user with easier mathematical analysis and, as suggested by Salb, would have provided more accurate analysis due to the signals being better defined in classical mathematical signal processing terms (column 7, lines 28-34).

4. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of Roussel and Salb and further in view of U.S. Patent No. 5,359,275 to Edwards.

As noted above, Matsumoto in combination with Roussel and Salb teaches many of the features of the claimed invention including determining a current ripple frequency by subtracting an armature current from a motor parameter, but the combination does not specify that the motor parameter be a second current signal of a different operating state.

Edwards teaches a load current fundamental filter with one cycle response including a means for calculating a current ripple wherein the current ripple is

determined by subtracting the current at a first state from the current at a second state (column 4, lines 48-60 and column 10, lines 16-20).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsumoto, Roussel and Salb to include a means for determining the current ripple by subtracting the current at a first state from the current at a second state, as taught by Edwards, because Edwards suggests a well-known and functionally equivalent method for determining the current ripple while obtaining good approximations of the current harmonics (column 4, lines 48-64).

5. Claims 7, 9, 10, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of Roussel and Salb and further in view of U.S. Patent No. 4,952,854 to Periou et al.

As noted above, Matsumoto in combination with Roussel and Salb teaches many of the features of the current invention including determining a rotational speed of a drive shaft of the motor based upon a the current ripple frequency but does not specify determining the position based upon the rotational speed.

Periou teaches a control device for a DC motor intended for driving opening elements on an automobile, such as a window (column 1, lines 23-25), including means for determining the rotational speed of the motor and from this speed determining the angular position of the motor shaft (column 2, lines 44-50).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsumoto, Roussel and Salb to include determining the position based

upon the rotational speed, as taught by Periou, because Periou suggests a method for controlling the operation of a window motor in a vehicle to stop upon detection of an object, similar to that of Matsumoto, Roussel, and Salb, that would have improved operation by actively determining position as compared to a set value as well as avoiding unnecessary stoppages by taking into account parameters of the circuit (column 2, line 45 to column 3, line 3).

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 1-7 and 9-19 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent No. 6,144,179 to Kessler et al. teaches a method for establishing the rotational speed of mechanically commutated DC motors including a ripple detector.

U.S. Patent No. 5,224,201 to Kruger teaches a method and device for measuring rotary speed.

8. Any inquiry concerning this communication or earlier communications from the



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examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jrw  
July 25, 2004

  
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